

# RESERVE COPY

## PATENT SPECIFICATION



Application Date: May 12, 1942. No. 6388/42.

554,711

Complete Specification Left: Jan. 12, 1943.

Complete Specification Accepted: July 15, 1943.

### PROVISIONAL SPECIFICATION

#### Improved Support for Fire Hose

I, FREDERICK WILLIAM BURT, of "St. Johns", Avon Road, Devizes, Wiltshire, a British Subject, by birth, do hereby declare the nature of this invention to be as follows:—

Principles employed.—To use the water-reaction pressure, plus a percentage of the weight of the device itself, to give a hold on the ground through one spike, the device to be fitted with a handle, and to be controlled by this means only, by one or two men, as may be advisable.

Purposes of the device.—To allow a substantial jet to be delivered at variable angles, to be easily within the control of one or two men, as may be advisable, and generally to reduce the number of branchmen and the danger and fatigue attendant on their work.

Construction.—The device consists of two parts, namely a branch holder arm and its attachments; and a reversible control handle.

The branch holder arm is of weldable tube of suitable strength. The lower part is formed into a spike, and this is curved forward, so that it will still hold in the ground when the arm is in an almost horizontal position. Above and on the back of the arm and raised a suitable space off the arm is a wide shallow U hose guide, into which the hose lowers at low forward angles, assisting to keep the spike in the ground. Above this guide, extending from the left side of the arm, as seen from the rear, is a substantial piece of flat strip steel, which is so bent on the flat that it passes the hose and then turns in behind the hose, leaving room for some backward hose movement. On the rear part of this strip is the socket into which the handle fits; this socket, as viewed from above, being in line with centre of hose. Above this extension on the arm is a curved strap rivet plate, above this the arm is bent forwards to allow the increased diameter of

the coupling, and then backwards to allow the smaller diameter of the branch. At the maximum forward point of bend, a piece of strip steel of suitable strength, and the arms of which are bent on the flat at 90 degrees to one another, is welded. The arms of this piece face rearwards, the holder arm tube being inside the corner formed by the right angle bend. On the ends of these arms, in line with one another, are U-pieces of flat strip steel, of suitable size into which the lugs of the coupling fit. On the top end of this holder arm is a curved piece of flat strip steel to support the branch.

The handle is of tube of suitable strength and is bent, near the socket, a suitable number of degrees, up or down, out of true, so that reversing will allow a change from "high jet" position to "low jet" position and *vice versa*. A suitable pin is provided to hold the handle in position. At the rear end of the handle is a cross tube, of sufficient length for two men to grasp, insulated and fitted with belt hooks if required.

All permanent joints are welded and finish generally to suit fire fighting purposes.

To use the device.—Two men—hose and branch laid ready. One man sets up to "high jet" or "low jet" position as required, and the other attaches branch and hose. The spike is then placed into a hole in the road or other surface. Second man then assists with handle. Water on. Jet is moved about as required. Assistance is necessary to support branch holder arm if it is necessary to reverse handle under pressure; and at low angles it is advisable for both men to place one foot each on hose, assisting to maintain a good spike grip.

Dated the 8th day of May, 1942.  
F. W. BURT.

### COMPLETE SPECIFICATION

#### Improved Support for Fire Hose

I, FREDERICK WILLIAM BURT, of "St. Johns", Avon Road, Devizes, Wiltshire, and a British Subject, by birth, do hereby declare the nature of this invention and  
[Price 1/-]

in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

#### 5 GENERAL INFORMATION.

The invention is an improved support for fire hose and consists of a device by means of which a substantial jet of water can be under the hand control only of one or two men, as may be advisable, according to the jet, fireground conditions, and other factors, within an elevation angle range of approximately 0 degrees to approximately 80 degrees and within an accompanying inclusive maximum lateral range of over 80 degrees.

The main principle employed is to use the water reaction pressure, plus the weight of the device itself, and the charged hose thereon, to give a grip on the ground through a frame, by means of one prong, reducing the effort of the branchman or men only to that necessary to direct the jet, by flexing the hose to the elevation angle of such jet, and twisting the hose to the lateral angle of such jet, and maintaining such jet where required and for as long as required, by means of an operating handle, which is suitable for either one or two man grip.

I find that, using hose of satisfactory size and flexibility, such as 2½" rubber lined (though 3½" can be used), the device functions in a very satisfactory manner, very large jets being controlled with reasonable effort by one man, though two would be advisable over a long period, and I consider that its qualities should make it of value in general fire fighting, as it is of fairly light weight, can be carried on any appliance, and also as it reduces the branchman's effort to a small percentage of that necessary to maintain a large jet when the branch is hand gripped only.

The main purpose of the device, therefore, is to allow a substantial jet to be maintained as aforesaid, and consequently, to reduce the number of branchmen and the fatigue and danger attendant on their work, especially under unfavourable conditions.

It may be of advantage for any study of this specification to be undertaken with an accompanying study of my earlier specification 546,813, which is similar in many respects. Both make use of reasonable forced curvature of hose immediately behind the branch, as this principle makes a considerable reduction of control effort possible. Experiment with 2½" rubber lined hose has shown that, if a length of some types is supported in a frame, flexed so that a right angle bend having two straight arms is formed, that at usual pressures, the said bend can be reduced to

as low as 5 inch inside radius without a crease forming in the hose. Whilst such a bend would place a considerable strain on the hose and is therefore not a practicable curvature, as it would eventually result in a burst in the outside of such curvature, where tension would be very great, I have concluded that this hose will readily flex to an inside curvature of anything above 10 inches and much experiment has shown that this is possible and that such flexing does not appear to have any serious effect on the hose, provided the same length is not always used for the purpose. In the case of unlined hose, which will only flex without creases at curvatures very much greater, results with these holders are not so satisfactory, and thus it must be understood that they are primarily designed for use with rubber lined hose.

The following is a brief comparison of the main points of the two specifications. No. 546,813 is a light tubular model for one man use only; this specification is of a more substantial tubular model for one or two man use. No. 546,813 has a fulcrum which varies with the jet elevation angle, being forward of the line of water reaction at low angles and well behind the line of water reaction at high angles, and thus the design is not suitable for very large jets, owing to the considerable uplift of handle at high elevation angles. This specification has a fixed fulcrum, somewhat forward of the line of water reaction, and always in the same relation to such line of reaction, and thus is suitable for very large jets, which exert a lifting effect on the branch and assist the branchman. No. 546,813 has no, or negligible, hose slide during elevation angle alterations. This specification has hose slide during such alterations and in the case where reaction is insufficient to assist such slide and/or hose curvature, the prong may rise out of its work hole in the ground. The centre of gravity of No. 546,813 is lower than that of this specification. No. 546,813 has a greater lateral range than this specification. Thus briefly No. 546,813 can be said to be a light one man holder for any jet up to approximately 1" at 100 lbs., or the equivalent thereof, and this specification can be said to be a more substantial one or two man holder for any jet between approximately ¾" at 100 lbs. and 2" at 100 lbs., or the equivalents thereof, assuming the resistance of the ground surface to prong penetration is sufficient for the larger jets.

#### THE ACCOMPANYING DRAWINGS.

These show various views of the device, also enlargements of parts of the device.

either not shown at all on these views, or not shown clearly.

Fig. 1 is a perspective view with the handle in the low elevation angle position 5 but does not show the pin which maintains the handle in its required position.

Fig. 2 is a side elevation, and shows the handle in its high elevation jet position, with hose and branch in place and under 10 pressure. The pin and hose strap are not shown.

Fig. 3 is a side elevation, and shows the handle in its low elevation jet position, with hose and branch in place and under 15 pressure. The pin and hose strap are not shown. It will be noted how the hose bears down on the broad U guide and maintains the prong in its work hole.

Fig. 4 is a perspective sketch of the pin 20 and the attachment which maintains this in its place.

Fig. 5 is a part front elevation and shows the device at a lateral angle, with hose and branch in place and under pres- 25 sure.

#### CONSTRUCTION.

The device is in two parts, namely, a branch holder arm and its attachments, and a two position control handle, and all 30 permanent joints of these two parts, unless otherwise stated, are of welded type.

Bearing in mind the many positions that the holder can be placed in, the following description assumes the branch 35 holder arm to be at about 45 degrees elevation but at no lateral angle. This arm A is constructed of tube of suitable strength. This length of tube is mainly straight, the lower end being formed to a point or spike 40 B, the part adjacent to this point B being curved forward so that the said point B would still hold in the ground if the arm A were lowered to a horizontal position. Above this curvature, and on the back of 45 the arm A and raised a suitable space off the arm A is a wide U-shaped hose guide C, made of wide flat strip steel bent on the flat to suitable curvature, and into which the hose lowers at low elevation 50 angles, the weight of such charged hose then assisting to maintain the spike B in the ground. This U-shaped guide C is supported at the required space from the arm tube A by, on the right side, a short 55 length of flat strip steel D, welded at convenient places to the arm tube A and the U-shaped guide C, and on its left side by an extension E on the arm tube A, which extension E takes the operating handle. 60 This extension E is constructed of flat steel of suitable thickness, which, previous to its bending, may be said to be shaped as a tall incomplete isosceles triangle, the two sides of which are joined by an arc of 65 a circle the said sides forming tangents to

the said arc, near the apex at which the sides of a complete triangle would meet. This shaped piece of flat steel is so bent on the flat adjacent to the said arc and 70 adjacent to the lower edge, and across the said piece in both places, that when the lower edge is secured to the left side of arm tube A, the main flat portion of this piece passes the hose, and, as seen from 75 above, is parallel to an imaginary centre line of the device, and, as seen from the side, has its own imaginary centre line square to the straight portion of arm tube A, and also has the arc shaped end turned in behind the hose, and adapted so that 80 a socket F, for the handle, is secured in line with the hose, as seen from above. The space between the arm A and the said arc-shaped end is sufficient to allow any space required for hose curvature at high 85 elevation angles. The left side of the U-shaped guide C, previously mentioned, is secured to the inside of this extension E described, at a convenient place. The handle socket F is of tube and is so cut and 90 secured to the extension E described, that, as stated, it is in line with the hose, as seen from above, and also so that it leans rearwards at between 100 and 120 degrees 95 to the straight portion of arm tube A, as seen from the side. Well above this extension E, on the arm A, and facing rearwards is secured a curved strap rivet plate G, of flat strip steel bent on the flat to 100 curvature to suit the hose, and length about one third the circumference of a circle, and drilled for attachment of strap ends of suitable material. Above this the arm A is bent forwards to allow the in- 105 creased diameter of the female coupling, and then back to allow the smaller diameter of the branch. At the maximum forward point of bend, a piece of flat strip steel, so bent on the flat that it has two 110 equal arms H at 90 degrees to each other, and so that the curvature at its bend is suitable to the circumference of the arm tube A, is so secured, that the arm tube A is inside the bend, that the arms H extend 115 rearwards at equal angles each side of an imaginary centre line, and that, as seen from the side, they are square to the straight portion of arm tube A. Secured on the ends of these arms H, in line with one another, having their open ends facing 120 the upper end of arm A, and suitably spaced to take the body of the female coupling, are two U-shaped pieces J, made from flat strip steel, bent on the flat to be a free fit on coupling lugs. Secured on 125 the upper end of the arm tube A is a piece of flat strip steel K, bent on the flat to curvature to suit average branches, and length about one third the circumference 130 of a circle, to support the branch.

The centre tube L of the handle is of suitable strength and is bent, near the socket F mentioned, a suitable number of degrees, up or down, so that, by removing the pin, and revolving the handle through 180 degrees, an alteration in the relative jet elevation angle to handle angle, by twice the amount the handle is bent out of straight, can be made, which allows suitable handle positions for "high elevation jet" or "low elevation jet" and which, with additional hand movements, allows cover for elevation angles between 0 degrees to 80 degrees. The socket F into which the handle fits is bored larger than the diameter of the main part of centre tube L of handle, and the latter is expanded or sleeved to be a good working fit in the socket F mentioned. The cross tube M of handle is of smaller diameter than the centre tube L, and is attached to the latter at a point mid way in its own length, this length being sufficient for two man grip, and insulated, if required. This cross tube M has secured, suitably spaced, and at suitable angles to hook under the belts of two branchmen, so that their hands can be temporarily freed for any purpose, such as fitting of gas mask; 4 U-shaped hooks N, 2 above and 2 below, made from round steel.

The handle is maintained in the socket F by a pin O which passes centrally through both the socket F, and that part of the handle which engages the socket F, horizontally from the left side and all holes are drilled so that the pin O is a satisfactory fit with the handle in either of its positions. The pin O is made from a short length of round steel, of as large diameter as suitable, which is bent mid-way to form a pin O, which has a blunt point, and an arm P, this arm being at right angles to the pin, and being flattened, through which flat a hole is drilled, for chain attachment. Around the pin O, adjacent to the bend mentioned, is secured a small thin collar R, in which is cut a notch. On the left side of the socket F, below the pin hole, is secured a small rectangular piece of steel S, having a hole for chain attachment of pin arm P, and so notched at its upper end that it will allow the pin O to be completely inserted when its arm P is, generally, approximately vertical, and will prevent the pin O from leaving its position after the pin arm P has dropped. The spring loaded type of pin, common to fire apparatus, may be used instead, if preferred.

The device is finished generally to suit fire fighting requirements.

TO USE THE DEVICE—TWO MEN.

1. Upon arriving at the scene of fire,

the two parts are connected in high jet or low jet position, as appears to be required and a "work hole" is made for the spike. One man controls the handle while the other attaches the branch, and coupling. Water on. Both men together operate the device if a large nozzle is being used.

2. During operation, the handle is not raised above breast height, as control decreases above this position, but is changed to its other position if a lower jet is required.

3. During operation, the handle is moved in the form of an arc of a circle to cover any lateral angle required.

4. During operation at low elevation angles, but more especially with large jets, branchmen each place a foot heavily on the hose, thus increasing the weight on the broad U-shaped hose guide, and maintaining prong grip.

5. Any skid should immediately be corrected by the lowering of the handle, thus raising the jet, and increasing down pressure.

6. Should it be required to change handle position under pressure, it is necessary that two men firmly support the branch holder arm, whilst a third man adjusts the handle.

7. Should it be required to release hand grip, the belt hooks are hooked under the branchmen's belts, a slight forward bodily pressure exerted on handle, and the hands freed.

8. Handle movements, causing deliberate skid and check skid, are not to be used to change the position of the holder.

#### MAINTENANCE.

This simple utility holder requires very little maintenance and if the hose strap is maintained in good condition, and renewed when damaged or worn, and if the connection between the two parts is greased occasionally, and the device painted as necessary, should give indefinite service.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A support for fire hose comprising a tubular member, the lower end of which is shaped to a curved spike, and to which is secured, adjacent to the said spike, a U-shaped support for the hose and an extension, adapted to pass the hose and which has secured at its rear a socket member to take a detachable and adjustable operating handle, which is bent near to its point of attachment to the said extension; and to the upper portion of which tubular member is secured a strain member for the hose, a two-armed member provided with

U-shaped end pieces adapted to engage lugs on the hose coupling, and a curved member to support the branch, said arm member being itself curved in its upper  
5 part to take the female coupling.

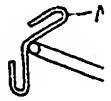
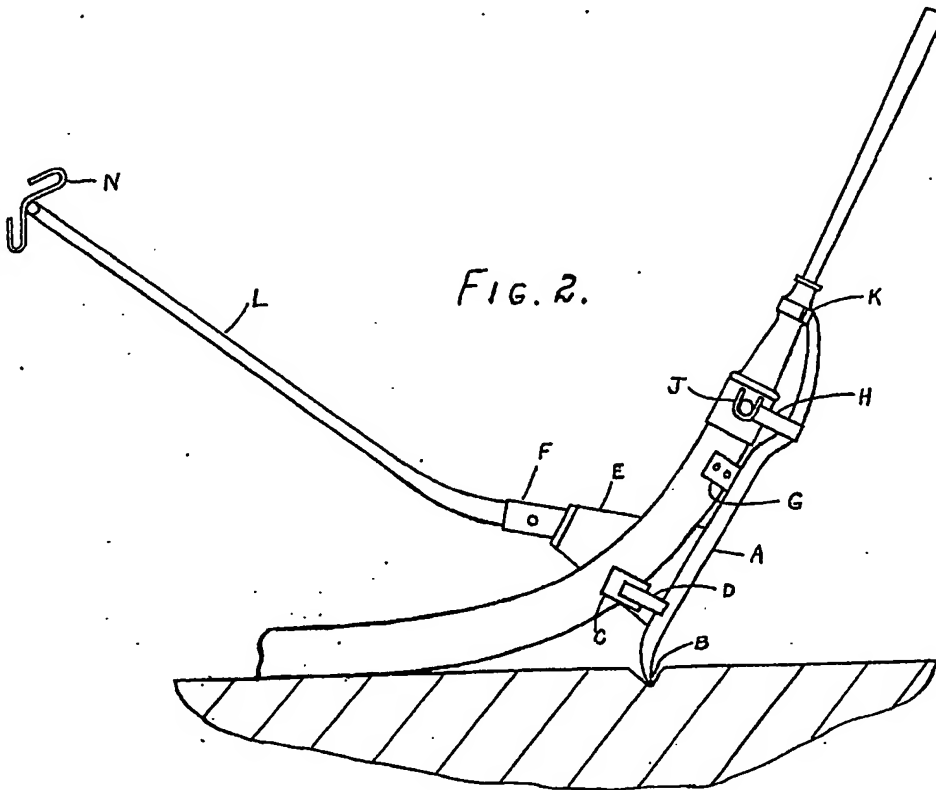
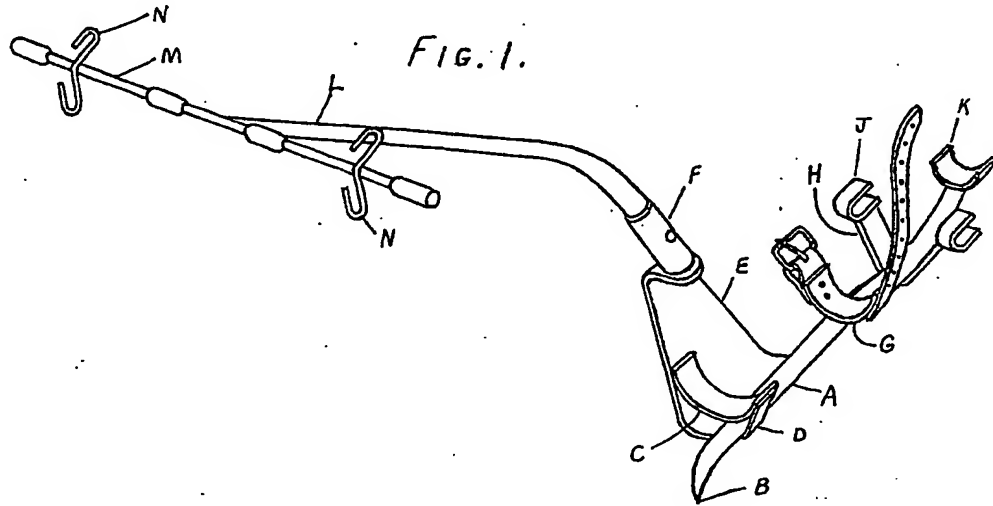
2. A support for fire hose, as claimed in claim 1, in which the required relative position of the said tubular member and its operating handle is maintained by a  
10 removable pin comprising a blunt pointed round member having a notched collar and an arm, the said notched collar being adapted to engage and be maintained in

place by a notched member secured to the socket, secured to an extension secured to  
15 the said tubular member.

3. Combined with the support for fire hose, as claimed in claims 1 and 2, the addition of a body attachment comprising  
20 U-shaped hooks, adapted to engage the branchmen's belts, with the operating handle in either of its positions, secured to the cross tube of said handle.

Dated the 11th day of January, 1943.  
F. W. BURT.

[This Drawing is a reproduction of the Original on a reduced scale.]





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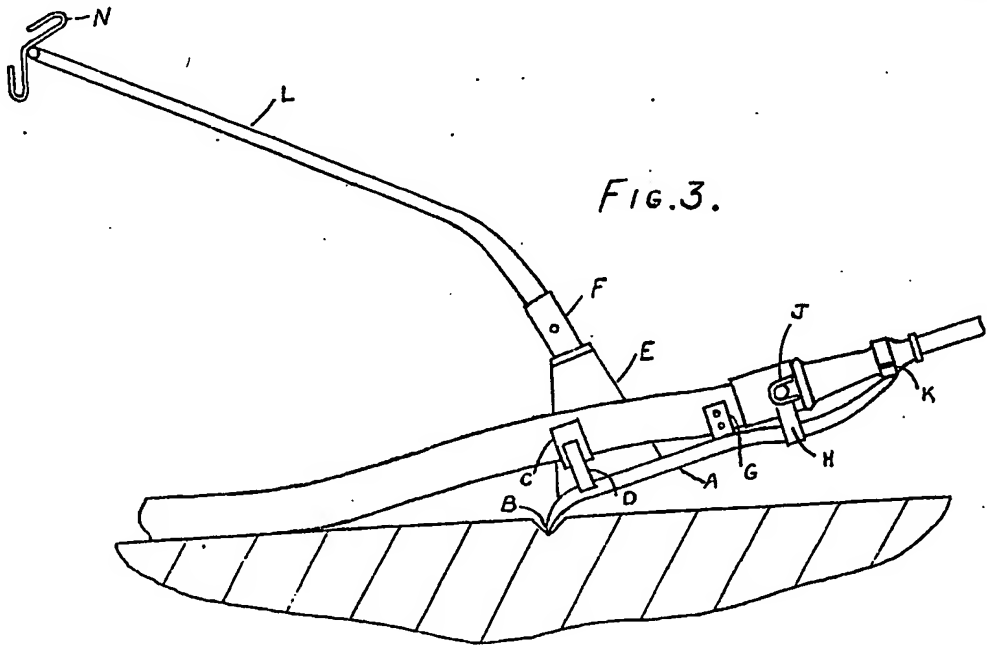


Fig. 3.

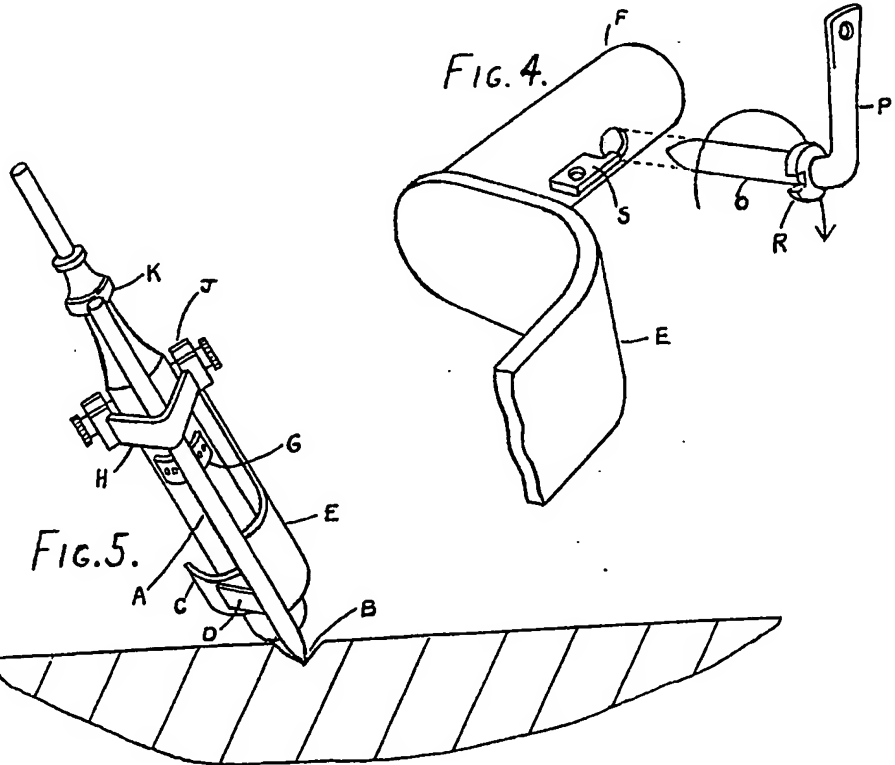


Fig. 4.

Fig. 5.

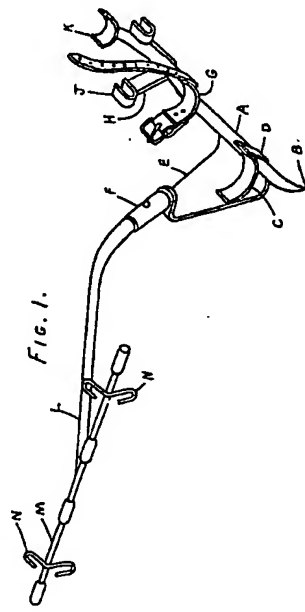


Fig. 1.

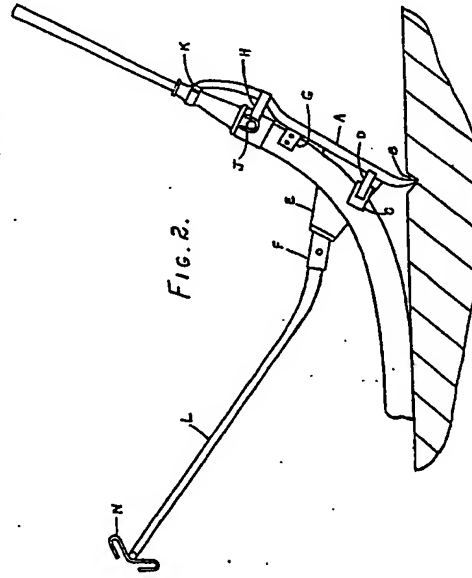


Fig. 2.

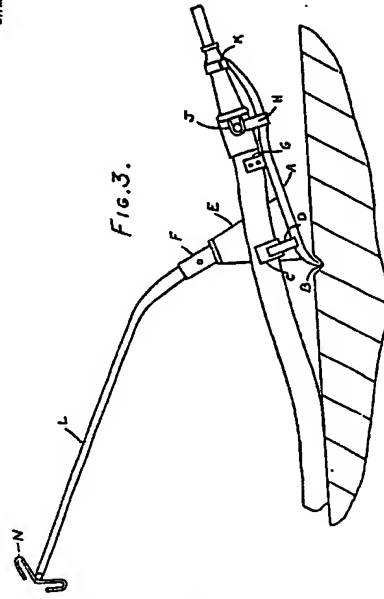


Fig. 3.

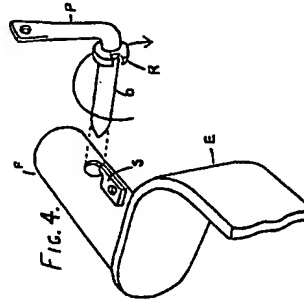


Fig. 4.

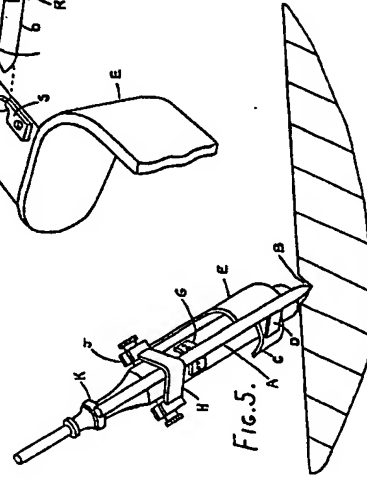


Fig. 5.